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ABSTRACT

A developed abilities performance battery (DAP) has been constructed based on the Project Talent Survey to serve two major functions in the guidance area of Project Plan. The first function is to enable teacher, parent, and student to realistically evaluate the student's present level of developed performance ability. The second function of DAP results is to provide detailed profiles of those abilities which a student must cultivate in order to reasonably expect attainment of a particular goal. If the student decides to continue pursuit of the goal based on his knowledge in these two areas, an individualized Program of Studies (POS) is generated for him to monitor the educational experiences which he will receive during the school year. The content and extent of this POS are determined in part by empirically obtained relationships between certain instructional elements and improved ability to perform on components important to the student's goal. Ability testing in Project Plan should enable the student to evaluate himself in light of well recognized goals and goal requirements and to recommend to him a Program of Studies most likely to facilitate attainment of the goals he selects. (KJ)

GUIDANCE TESTING AND THE INDIVIDUALIZED PROGRAM OF STUDIES

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At a recent conference of directors of state testing programs, one of the most prevalent concerns was with strategies for using standardized test scores in some educationally meaningful way. It seems that comprehensive, well-planned testing programs are no longer the exception in many of our nation's schools. The concern of responsible officials is now with persuading teachers to make proper use of the test scores which are now so neatly filed on gummed stickers in student cumulative record folders. This is a valid concern, and I would submit that it stems from the fact that we don't really know <u>what</u> to tell teachers and counselors about using test scores to influence the educational experiences of a majority of their pupils. This is to say that except for the identification of children with drastic learning problems, candidates for special education, etc., a vast gap exists between well-normed profiles of test scores for a student, on one hand, and valid recommendations about what instructional activities will most benefit the student, on the other. Worse yet, the prevalent situation is not at all compatible with what Hill (1969) has called the primary measurement purpose of helping the youngster grow in understanding of himself.

There are several possible reasons for this situation. The first, of course, is that schools rarely engage in actual instruction on the nature of individual differences and the relationship between such differences to success in various life activities. Students may gain such knowledge through the counseling process, but the majority of pupils are not able to benefit from early and prolonged contact with a professional counselor. Further, currently used forms of reporting test scores are difficult to relate to

the actual skills of individual learners since they are generally norm- rather than criterion-referenced. Teachers, parents, and pupils often remain apathetic about entering into goal setting and planning activities until relatively late in the school experience--or perhaps not until after the student graduates.

Other factors apparently enter in along the way. Not the least is the fact that many educators perceive the potential for modifying a measured profile of abilities to be quite low. There is little evidence to suggest that conventional educational systems can adjust sufficiently to provide differential modes of instruction needed to meet the needs of individual students.

Project TALENT

The Project TALENT Survey (Flanagan et al, 1962; Flanagan, 1969), which was supported by the United States Office of Education, has done much to portray current and emerging limitations in American education. TALENT is a large-scale psychometric investigation which began with the testing of over 440,000 secondary pupils in 1960. One year and five year follow-up studies have now been completed on samples of students from this population who took the battery as high school seniors and juniors. These studies have provided disturbing data about the lack of realism in career plans and lack of relevance to student requirements of current curricula and instructional methods. On the positive side, however, TALENT has resulted in a data bank which promises to add a new dimension to the educational usage of test scores.

Included in the TALENT battery were 119 separate subscales measuring different aptitudes and abilities in areas most likely to show a differential

pattern of scores across individuals. By examining these scores in the perspective of the educational and occupational experiences of persons one and five years out of high school, it is now possible to look at the relationship between the TALENT test scores and membership in most viable occupational activities. Quirk (1969) has presented a description of the process which was followed in purifying occupational group membership and in computing point-biserial correlation coefficients between this dichotomous variable and scores on 17 selected cognitive subscales. In this study, based on a sample of over 28,000 cases, biserial multiple correlations ranged from .14 to .64, indicating a fairly high relationship between membership in some career plan groups and prior ability. Some of the career plan groups for males which can be predicted moderately well include chemist (0.37), engineer (0.43), architect (0.35), M.D. (0.50), lawyer (0.37), college or university teacher (0.38), teacher of music (0.39), carpenter (0.43), farmer (0.39), electrical or electronic engineer (0.46), and auto mechanic (0.39). Some of the career plan groups which can be predicted moderately well for females include teacher of high school math (0.64), teacher of high school science (0.36), college or university teacher (0.36), salesclerk (0.43), and hairdresser (0.36).

It may be seen that the availability of such data, when coupled with a student's own profile of equivalent scores, would be of much potential as a planning aid in enabling the formulation of more realistic goals. This potential can be realized only if an educational system can be made responsive to the individual differences in student need which will be created.

Project PLAN

Project PLAN (Program for Learning in Accordance with Needs) is a comprehensive system of individualized education which has as its general

objective that each student should receive those educational experiences which will best develop his talents in such a way as to achieve maximum satisfactions from the life's activities he chooses to pursue (Flanagan, 1967, 1969). It provides the use of learning methods and materials in the basic subject matter areas of English, mathematics, social studies, and science. These are designed to enable each student to acquire in grades one through twelve that information and those abilities, skills, and behavioral patterns which will enable him to achieve his goals. But, most important for the present topic, PLAN provides a mechanism for enabling students to make use of the best available occupational information and techniques in formulating goals and plans which reflect essential satisfactions for them.

A battery of developed ability performance tests (DAP) was constructed to serve two functions within PLAN (Table A lists the 18 subscales which comprise this battery). First, every effort has been made to provide scores which have an intrinsic meaning in and of themselves. For example, reading comprehension scores are expressable in terms of the number of passages a student can read from popular literature of varying degrees of difficulty. This enables a periodic evaluation in terms of actual skills which a student can perform, rather than in terms of more obtuse percentiles, grade equivalents, etc.

Second, DAP subscales have been equated with the similar TALENT measures to take advantage of the follow-up data which has been mentioned earlier. PLAN students can thus relate their ability profiles to the experiences of TALENT students with similar profiles. In order to facilitate this comparison and bring it within manageable dimensions (in that TALENT data is available for over 200 male and female occupations) twelve long range goal (LRG) families were first determined on an a priori basis. The occupational groups which went into these families were then confirmed by statistical analyses described

in detail by Shaycoft (1969).

The twelve groups are as follows:

(1) engineering, mathematics, physical science, architecture

(2) medical and biological professions

(3) business administration

(4) general teaching and social service

(5) humanities, law, behavioral and social sciences

(6) fine arts, performing arts

(7) technical

(8) business, sales

(9) mechanical and industrial trades

(10) secretarial, clerical

(11) construction

(12) general, community service, public service

These occupational families contain approximately 85% of the jobs described in the Dictionary of Occupational Titles and serve as a logical basis for planning and decision making instruction which takes place within the PLAN Guidance Program. The instruction is in the form of modular teaching-learning units which are designed to: (1) introduce the students and their parents to the fact that plans and decisions made in high school can affect their educational and occupational futures; (2) provide relevant facts which are useful in making such decisions; and (3) give students the opportunity to practice decision making using this information.

As an example of the types of facts which are provided, Figures 1, 2, 3, and 4 present profiles for four example occupations from LRG's 1, 2, 7, and 9. The profiles indicate the mean and standard deviation of 12 TALENT scales for actual exemplar occupations from each of these four LRG groups.

The student can compare his own profile to sixty profiles such as this based on TALENT data.

An example of decision making practice is the TALENT career exercise, in which anonymous TALENT case studies are examined in depth beginning with their actual pre-graduation characteristics and progressing through the course of their occupational development. PLAN students are required to make decisions for these cases at various points and then check their choices against the actual decisions which were made.

The last step in the guidance chain calls for the student and his parents to select an LRG which they feel would best represent his goals, using what they know about: (1) his own psychometric pattern of developed abilities and interests; (2) the activities that are most satisfying to him; (3) the activities that are represented in the occupations contained in the various LRG's; and (4) the requirements for the jobs in the various LRG's.

Determination of Individualized Programs of Study

Student and parent inputs based upon the procedures noted above constitute one major factor in determining an individualized student curriculum in PLAN. The student who chooses LRG 1, for example, is assumed to have as his goal a career in the physical sciences, meaning that in order to realize this goal he will need to master a rather heavy dose of mathematics and science in high school when compared to the student who elects another LRG. Other factors which are considered in determining student program requirements include: (1) state and local course definitions; (2) instructional resources available in the PLAN catalog of learning materials; (3) teacher recommendations regarding the student's most effective learning styles; (4) past academic records; and (5) current level of academic achievement as measured by a set of curriculum imbedded PLAN achievement tests. Dunn (1970) has

presented a detailed analysis of these factors in his description of the individualized curriculum, and they will not be covered further here.

However, it should be noted that the contributions of the developed abilities test do not cease with inputs to the Guidance Program that have been mentioned so far. It is recognized that some students and parents will make LRG group choices which are not in complete agreement with the choices that would be made if psychometric data alone were considered. In such cases, the computer system which generates the Programs of Study in PLAN goes through a series of routines to merge the data-suggested LRG with the student-parent selected LRG. This process insures that students who have high measured ability levels are not slighted in their educational experience due to a choice which may reflect a lower aspiration than is realistic. In cases where the opposite occurs, the student-parent LRG is honored. The net result is to achieve a Program of Studies which contains the educational requirements for both the student's expressed choice and the choice which most closely matches his measured pattern of abilities and interests.

The Program of Studies (POS) which is finally generated suggests a customized set of modules containing all of the instructional units in the subject matter areas which the PLAN student is to take during the year. Figure 5 illustrates a sample POS for a primary student in Language Arts. The student and teacher both receive copies of the POS documents and use them, with periodic updating, to plan their activities throughout the year. This system allows a significant amount of ungrading at all levels in PLAN.

The final contribution of the Developed Ability Performance battery in generating individualized Programs of Study involves the determination of module quota. It is recognized that individualizing content according to student needs does not in itself account for the different <u>rates</u> at which various students complete their programs. To individualize not only the

quality but quantity of modules appearing in a POS, stepwise multiple regression analysis was performed using DAP scores against the number of modules completed for selected samples of students at the various grade levels. Table A shows an example of the results of such an analysis for Grade 10 Social Studies. On the basis of weights derived from regression analyses, a quota is identified for each PLAN student in each subject area. Modules are then assigned to him on the basis of his LRG group membership until this quota is filled.

Summary

A developed abilities performance battery (DAP) has been constructed based on the Project TALENT Survey to serve two major functions in the guidance area of Project PLAN. The first function is to enable teacher, parent, and student to realistically evaluate the student's present level of developed performance ability. Wherever possible, the ability is expressed in terms of specific skills the student possesses. Guidance instruction components in PLAN have been designed to enable students to make such evaluations. The second function of DAP results is to provide detailed profiles of those abilities which a student must cultivate in order to reasonably expect attainment of a particular goal.

If the student decides to continue pursuit of the goal based upon his knowledge in these two areas, an individualized Program of Studies (POS) is generated for him to monitor the educational experiences which he will receive during the school year. The content and extent of this POS are determined in part by empirically obtained relationships between certain instructional elements and improved ability to perform on components important to the student's goal.

The integration of ability testing into a guidance program has posed

distinct problems. Normative comparisons and the perceived low potential for modifications of traditional abilities have resulted in relatively infrequent use of diagnostic ability testing. Further, the lack of demonstrated relationship to effective instructional strategies has generally rendered ineffective the scores that are obtained. Ability testing in Project PLAN should enable the student to evaluate himself in light of well recognized goals and goal requirements and to recommend to him a Program of Studies most likely to facilitate attainment of the goals he selects.

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TABLE A

Multiple Regression Analyses for Predicting Number of Modules Completed in Social Studies for Grade 10 Students

	Criterion	Stepwise Analysis				Final Analysis	
	r_{xy}	Order*	b	β	βr_{xy}	β	βr_{xy}
Secondary D.A.P. Variable							
1. Vocabulary	.251	6	.093	.147	.037	.071	.018
2. Word Memory	.224	11	.083	.065	.015		
3. Arithmetic Reasoning	.229	15	.081	.047	.011		
4. Introductory Mathematics	.322	1	.320	.211	.068	.188	.060
5. Language Usage	.050	8	-.175	-.117	-.006		
6. Effective Sentences	.121	-					
7. Punctuation Marks	.273	2	.336	.205	.056	.137	.037
8. Structure of Sentences	.236	9	.265	.122	.029	.063	.015
9. Spelling	.150	12	-.232	-.117	-.018		
10. Capitalization	.167	13	.120	.069	.012		
11. Abstract Reasoning	.236	3	.349	.159	.038	.122	.029
12. Mechanical Reasoning	-.011	4	-.384	-.193	.002		
13. Word Representations	.156	16	.040	.039	.006		
14. Ingenuity	.199	7	.191	.120	.024		
15. Two Dimensional Figures	.027	17	.014	.011	.000		
16. Reading Comprehension	.139	14	.028	.057	.008		
17. Three Dimensional Objects	.102	10	-.142	-.088	-.009		
18. Word Relations in Sentences	.080	5	-.252	-.205	-.016		
Constant			1.643	--	--	--	--
Number of Variables					17		5
Multiple Correlation					.506		.399
Coefficient of Multiple Determination					.256		.159
Corrected Multiple Correlation					.426		.369
Corrected Multiple Correlation Squared					.181		.136

*Order of selection in stepwise analysis

LONG RANGE GOAL 1: ENGINEERING, PHYSICAL SCIENCE, MATHEMATICS, ARCHITECTURE

12th Grade Profile of 12 Measures of Developed Abilities for Female Students Who Were Later Identified as HIGH SCHOOL MATHEMATICS TEACHERS

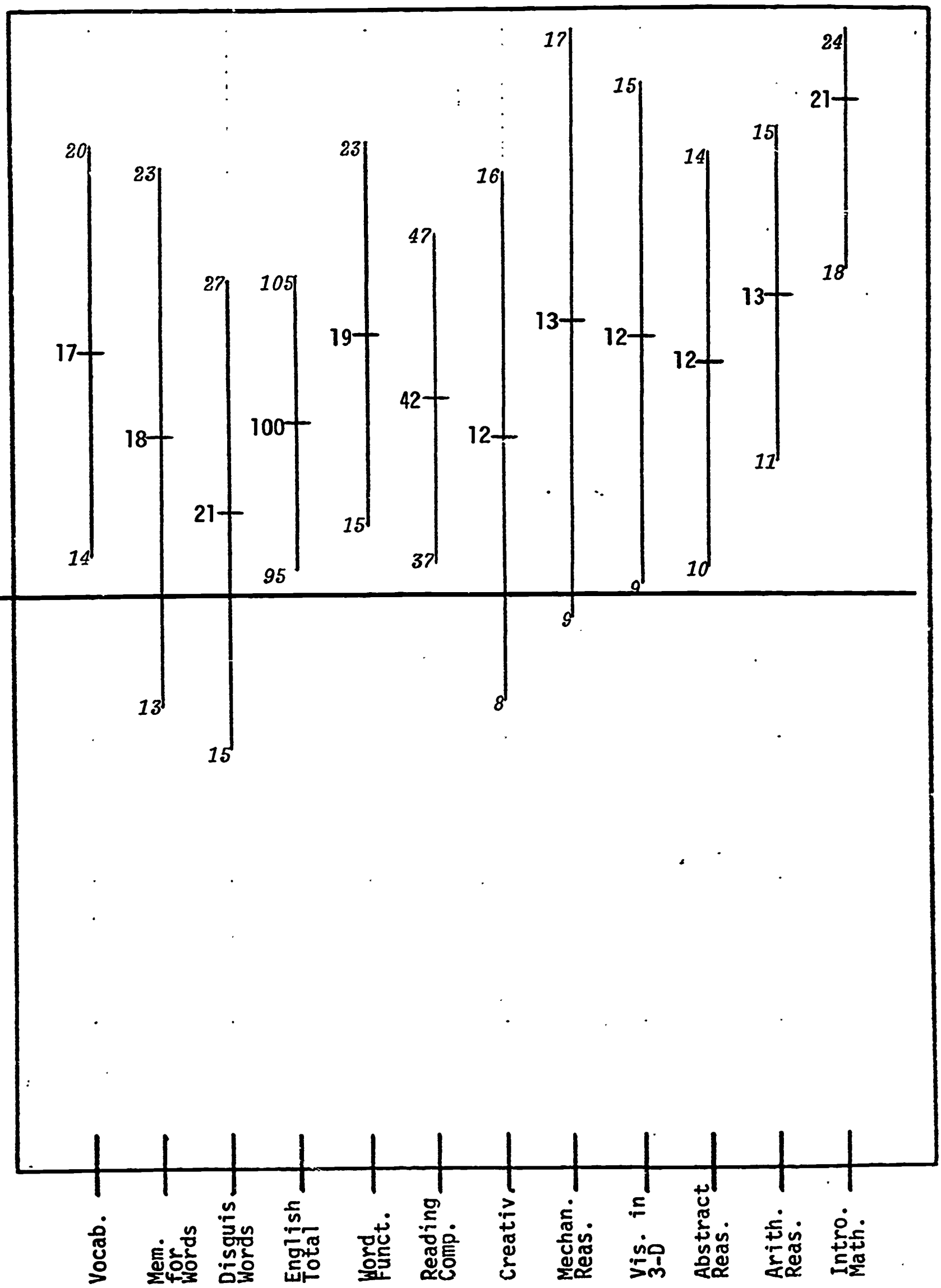

Figure 1

LONG RANGE GOAL 2 : MEDICAL AND BIOLOGICAL SCIENCES

12th Grade Profile of 12 Measures of Developed Abilities for Male Students Who Were Later Identified as BIOLOGISTS, ZOOLOGISTS

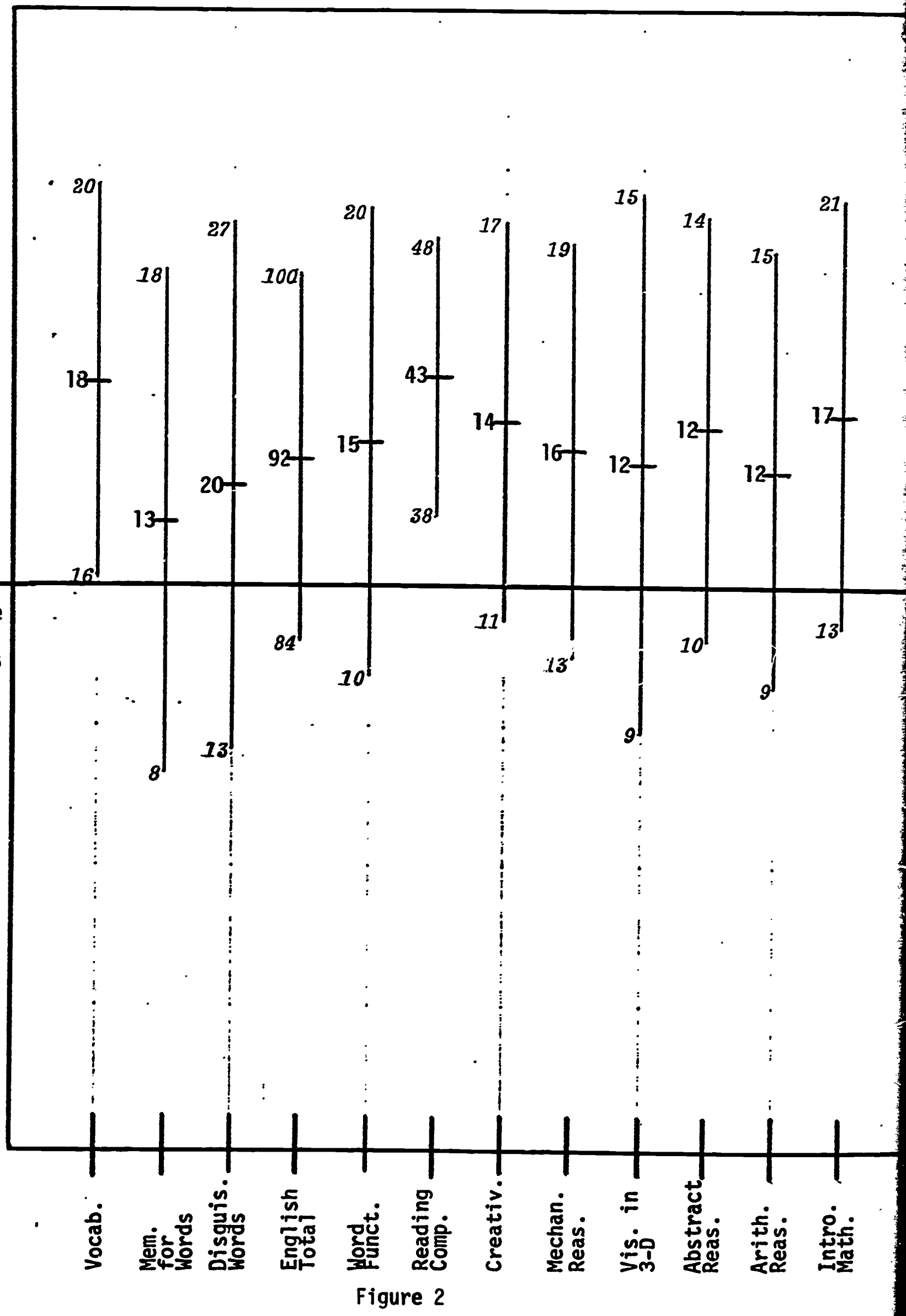

Figure 2

LONG RANGE GOAL 7 : TECHNICIANS - MEDICAL, ELECTRONIC

12th Grade Profile of 12 Measures of Developed Abilities for Male Students Who Were Later Identified as DRAFTSMEN

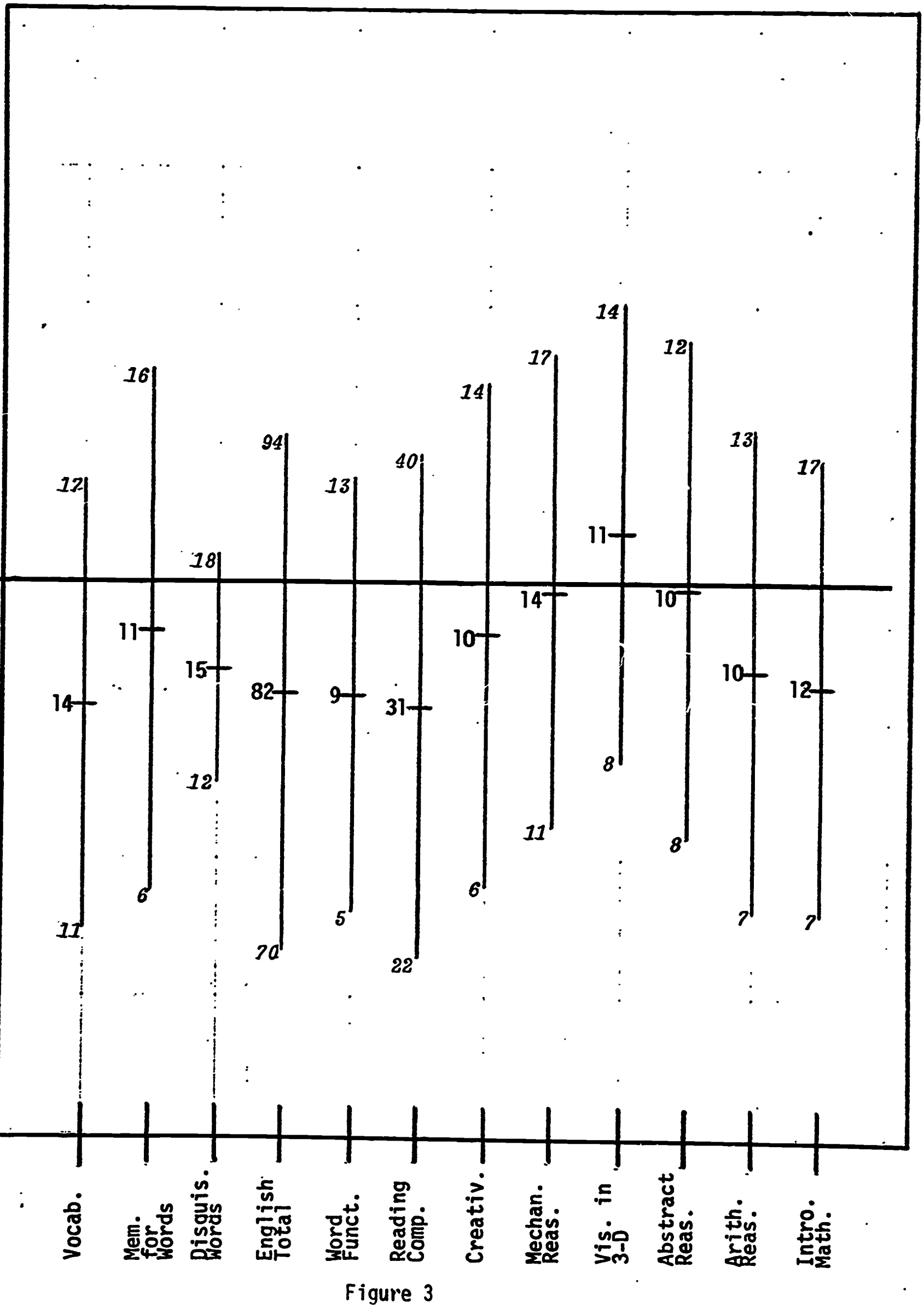

Figure 3

LONG RANGE GOAL 9 : MECHANICAL AND INDUSTRIAL TRADES

12th Grade Profile of 12 Measures of Developed Abilities
for Male Students Who Were Later Identified as ELECTRICIANS

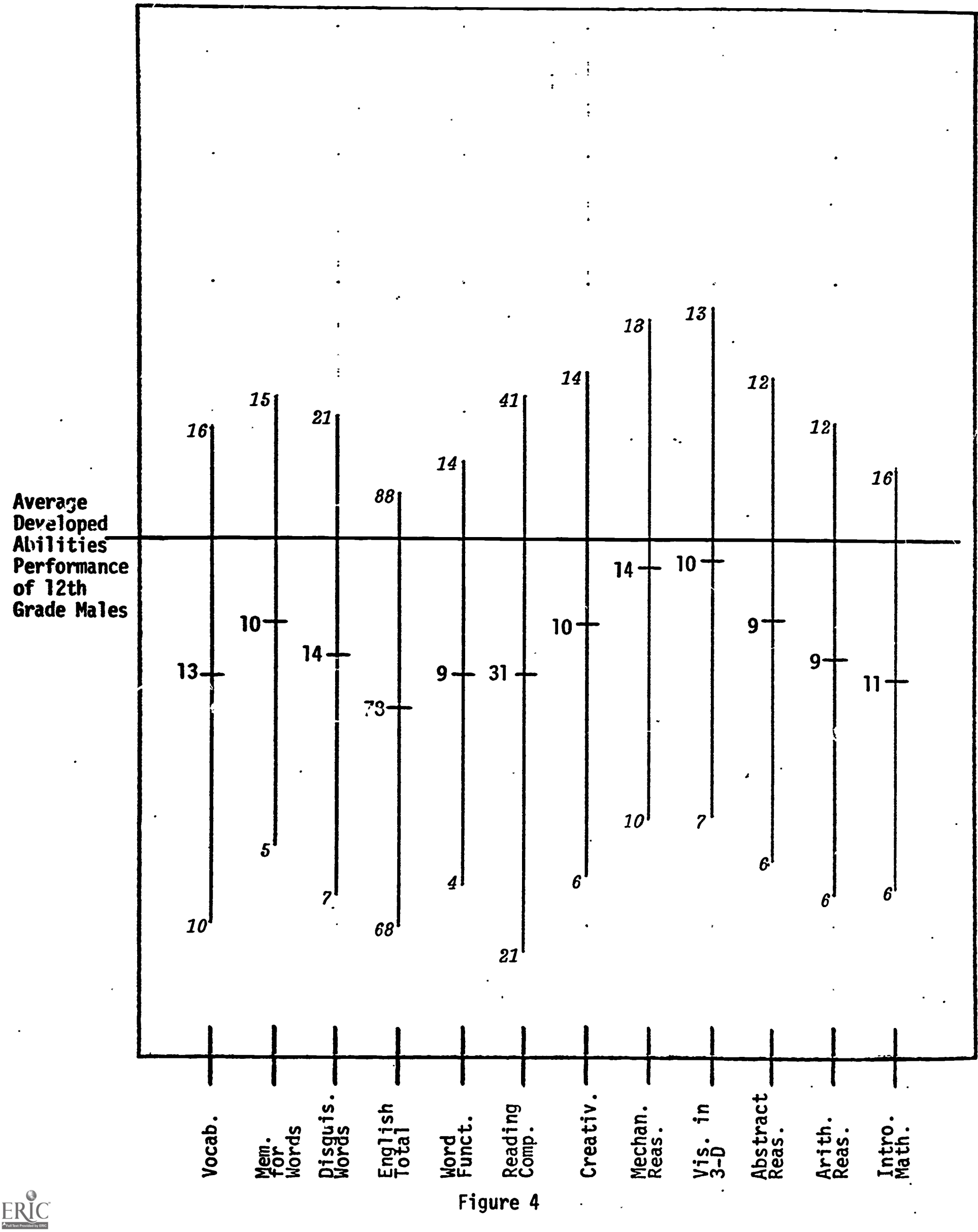

Figure 4

PLAN

PROGRAM OF STUDIES AND STUDENT PROGRESS REPORT FOR **EAGER VERNON**

060140-02-0 SCHOOL **ADDISON** TEACHER **MRS. ETHEL BARKER** SUBJECT AREA **LANGUAGE ARTS** DATE **11/16/69**

COMPLETION CODE	MODULE NUMBER	MODULE NAME	DATE FINISHED
	81-051-0	LANGUAGE ARTS ACHIEVEMENT TEST	
	12-059-0	SULLIVAN BOOK 12(A)	
	10-101-0	ABOUT MYSELF	
	12-060-0	SULLIVAN BOOK 12 (B)	
	12-061-3	SULLIVAN BOOK 13 (A)	
	12-062-3	SULLIVAN BOOK 13 (B)	
	12-063-3	SULLIVAN BOOK 14 (A)	
	12-064-3	SULLIVAN BOOK 14 (B)	
	10-107-3	DRAMATICS	
	10-108-3	WINDY, RAINY, AND SUNNY DAYS	
	10-109-3	STORY WRITING	
	10-110-3	A VISIT ON PAPER	
	10-111-3	BEARS ON HEMLOCK MOUNTAIN	
	10-112-3	ANIMAL STORIES	
	10-113-3	AND TO THINK THAT I SAW IT ON MULBERRY STREET	
	10-114-3	THANK YOU, MR. BELL	
	11-151-3	PEGASUS	
	13-161-3	SUBJECT, PREDICATES, AND NOUNS	
	11-152-3	THUNDER	
	11-153-3	THE KNIGHT	
	11-154-3	THE SAD TIGER	
	13-162-3	PROPER NOUNS, COMMON NOUNS, AND DETERMINERS	
	11-155-3	SUSY'S FEARS	
	11-156-3	SMILES FARM	
	11-157-3	THE ROUNDABOUTS SECRET	
	13-163-3	PRONOUNS AND SUBJECTS	
	11-158-3	BUGABOO	

Figure 3